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ABSTRACT

The goal of this practicum was to increase the retentive skills of sixth graders in the area of elementary music reading and writing. A secondary goal of the study was to introduce music education teachers to the use of computer-assisted instruction in elementary general music class. For 12 weeks, 88 sixth graders learned music using computer-assisted instructional programs. "Music Fundamentals," published by Silver Burdett, was chosen as the courseware. Students worked in pairs on the notes of the treble clef scale, rhythms, and the piano keyboard. Each class began and ended with a review of the material that was presented on computer screens, and records were kept of student notetaking. Students completed several assignments that demonstrated retention of the material taught via the computers. After 3 months of implementation, children demonstrated retention in areas of rhythm and melody by successfully completing the unit with limited review, and members of the education staff reported that the students' level of motivation had increased. It is noted that instructional effectiveness still requires that attention be paid to the level of development of the students using the software, and that traditional as well as nontraditional educational strategies be used, such as the Kodaly method of applied music education. The report concludes with a recommendation that the study be expanded to include other grade levels for greater amounts of time. (45 references) (Author/DB)

Improving Retention in Music Fundamentals Through the Use of Computer Based Instruction

by

David Weintraub

Cluster 36

A Practicum I Report Presented to the
Ed.D. Program in Early and Middle Childhood
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

NOVA UNIVERSITY

1991

PRACTICUM APPROVAL SHEET

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This practicum report was submitted by David Weintraub under the direction of the adviser listed below. It was submitted to the Ed.D. Program in Early and Middle Childhood and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova University.

Approved:

April 3, 1991
Date of Final Approval of Report

Mary Ellen Sapp
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ABSTRACT

Improving Retention in Music Fundamentals Through the Use of Computer Based Instruction. Weintraub, David, 1990: Practicum I Report, Nova University, Ed.D. Program in Early and Middle Childhood. Descriptors: Computer Aided Instruction/Computer Based Instruction/Computer Education/Memory/Music/Music Education/Kodaly Method/Memory/Music Theory/Retention.

The goal of this practicum was to increase the retentive skills of sixth graders in the area of elementary music reading and writing skills. A secondary goal of the practicum was to introduce music education staff members to the use of computer based instruction in elementary general music class.

For twelve weeks, 88 sixth graders learned music via computer based instruction. *Music Fundamentals,* published by Silver Burdett was chosen as the courseware. Students were exposed to notes of the treble clef scale, simple rhythms, and the piano keyboard. Students worked in pairs in a computer lab housing 14 computers. Each class began and ended with a review of the material that was presented on their screens. Records were kept regarding student notetaking. Students completed several assignments that demonstrated retention of the material taught via the computers. As a related activity, the school district's elementary music staff attended a workshop, given by the writer, introducing them to computer based instruction.

After three months of implementation, most of the results of the practicum were favorable. Children demonstrated retention in areas of rhythm and melody by successfully completing the unit with limited review. A number of students, however, refused to complete any homework. Further work is needed on the efficacy of grades in elementary music classes because of the large number of students who chose not to complete assignments.

CHAPTER I

INTRODUCTION

Description of Work Setting and Community

This practicum was conducted in a public school system located in a suburban community, along the northeastern Atlantic Coast. The township area of the school system encompasses 25.8 square miles and is equidistant between two major eastern cities.

The school system serves a population of approximately 41,000. Unlike the surrounding townships, whose populations are nearly all white, the community has a large and unique ethnic variety. Blacks and Hispanics constitute one in four residents of the community. A large Hassidic population of over 4,000, which educates its youth in non public school, also resides in the town. Residential growth is continuing, as noted especially in the construction of new apartments and condominiums. Hassidics and Hispanics are the fastest growing segments in the population (Argote-Freyre, 1989).

The current enrollment in the public school system is 5,026 students. They are housed in one high school, one middle school, one central sixth grade and four elementary schools grades K-5.

The district's master plan calls for continued growth in school enrollment through the year 1996. Bearing these future needs in mind, a referendum was passed in 1987 to close the central sixth grade facility and build annexes to two of the existing K-5 buildings. Construction was scheduled to begin by early 1989, but was delayed until late 1990. The actual closing date of the practicum school has yet to be announced, as of this time. In addition to the public school system, the district operates one of the largest community education programs in the state. These programs include evening enrichment classes, alternate high school degree programs, as well as events and travel opportunities for seniors. Another feature of the public school system is the latch key program created due to the large number of children who daily return from school to empty homes.

The racial makeup of the school district population differs greatly from that of the township. The township's population is approximately 67% white, 13.6% black, 8.4% Hispanic, and 1% other, while the public school racial breakdown is 42% white, 20% black, and 38% Hispanic. The differentiation comes not only from those families who send their children to parochial schools, but from the fact that the large Hassidic population sends its 1,900 children to no less than nine schools operated by members of their community. In fact, the non-public school enrollment is 2,970, more than half the all the township's children.

The school district is administered by a seven member publicly

elected school board, which appoints a superintendent and two assistant superintendents. Tensions between the Board of Education and both the superintendent and teachers have historically been common.

The township is home of an industrial park of 151 companies. These various industries employ 9,000 individuals (Lakewood, 1989). Many working parents of public school children are employed within this large employment base.

The township has completed a six million dollar downtown improvement plan, including renovations of the historic district, new store frontery and the installation of antique street lighting. The urban renewal has been accompanied by the continued success of community intervention groups, whose leaders are comprised of members of the National Association for the Advancement of Colored People (NAACP), the police and religious leaders (Argote-Freyre, 1989).

Writer's Work Setting and Role

The writer of this practicum is one of a staff of twelve music teachers in the district, six of whom teach instrumental music and six, like the writer, who teach vocal music. The writer is responsible for the musical education of approximately 410 students who attend the central sixth grade building. These students are housed in a building built in 1907, which is scheduled for closing in either 1991 or 1992. The students are divided into

19 classes, 5 of which are special education. Each student receives one weekly 40-minute period of music. An entire homeroom class, which averages 24 students, takes music together. Classes are cancelled should assemblies or class trips occur, thus lowering the possible number of 40 classes to approximately 34. Sixth grade is the last year that the district mandates general music. For many this will be their last music educational experience for life.

General music is taught in a basement classroom. While the room has exposed pipes and is physically not attractive, the writer has painted the walls, pipes and duct work with bright colors. Facilities include a large audio visual library, a sophisticated component stereo system, and a piano. It should be noted that, although the surroundings may be unprepossessing, the writer is the only elementary vocal music teacher in the district who teaches in a classroom set aside for the subject; all others are forced to travel from class to class carrying a modicum of resources.

The writer is also responsible for one and a half days work per week at one of the lower elementary schools, teaching music to children in each grade K-5. The weekly travelling has helped the writer to view the variances in facilities within the district, allowing for a more objective evaluation of the district-wide implementation of music eduction. Facilities in one school include having a separate music office with rehearsal space, while the

facilities in another school demand music is taught on the stage of a "cafetorium."

The writer's background includes a bachelor of science degree from a major school of music and a master of education degree with an emphasis in choral conducting. The writer holds a certificate to teach music grades K-12, but has taught all grades including college, (both as an adjunct and full-time faculty member) in his 15 years of experience. Besides his public school responsibilities, the writer currently teaches marketing, travel and tourism, and music fundamentals at two local colleges.

CHAPTER II

STUDY OF THE PROBLEM

Problem Description

As part of the district-wide music curriculum, students are taught the fundamentals of music beginning in third grade. The teaching of these rudiments of music, which lead to the mastery of the elements of the language of music, has not proved to have great success in the area of student retention.

The opening steps in this path of understanding are traditionally called *fundamentals of music,* while the more advanced stages are called *music theory. Fundamentals* are generally concerned with mastery of the rudiments of notation of pitch and rhythm. (The objectives are listed in Appendix A.)

Theory takes this path forward with advanced rhythms, accidentals, key signatures, scales, intervals, chords, and harmony. Although the science is not finite (music theory is a requirement of most graduate music programs), it is extremely measured and sequential. It is this logical stepwise movement of objectives that makes the evaluation of fundamentals simpler than many other forms in the art of music. A student cannot compose traditional

music unless he or she has mastered these foundations.

The district curriculum for upper elementary students lists fundamentals as one of several components of general music that are expected to be taught. To this end the district provides a weekly 40 minute music class taught by a certificated music educator. These components also include singing in harmony, vocal technique, music history, music theatre, and if time allows, square or folk dancing.

While the usage of both music books in general music class and choral octavos in choir is common, it has been found that students still rely on reading only the words of a song, rather than reading the words and music, when learning a new work. Few children direct their attention to either the printed notes or the musical symbols in the song.

This problem has had several negative results. Students often maintain poor music reading skills in performing ensembles. There is frustration on the part of students when attempting to master the unit on fundamentals. Finally, those students who wish to study music theory in high school are severely handicapped.

Teachers need to understand the causation for this lack of retention in the area of fundamentals. This problem was seen most clearly in sixth grade, as witnessed by the fact that the writer's job description includes teaching all the district's 24 sixth grade general music classes. These students represent a compilation of the teachings of four lower elementary vocal music teachers, each

possessing different teaching styles, yet all following the district's objectives for the mastery of music fundamentals.

The problem reoccurs yearly: students have poor retentive skills in the area of music reading and music writing. If the problem was solved, students would not have to be retaught the same music reading skills each year, and would also perform (both on paper and with instrument or voice) with greater facility.

Problem Documentation

The existence of the problem was noted in the school year 1989-1990 when 128 sixth grade students were evaluated for their ability to identify rudimentary music symbols of pitch and rhythm. After providing students with an eight-week unit on music fundamentals (see Appendix A), students were evaluated by the use of a teacher-designed instrument. This instrument (see Appendix B) examined the performance of the students in the cumulative areas of symbol identification (problem #1), meter (problems #2, #3, and #5), treble clef note identification (problem #4) and free compositional skills (problem #6).

All scores on the instrument were rounded off to the nearest 10 with 100 being a perfect score. The writer felt that the achievement should have been higher based on the amount of time (an average of three out of eight weeks) spent on review of work not mastered in the lower elementary grades due to poor retention of material.

Table 1

Test Scores for Sixth Grade Unit Exam on Manipulating Simple Rhythms and the Identification of Note Names

n=128

Grade	Number	Percentage
100	21	16%
90	32	25%
80	29	23%
70	30	23%
60	09	7%
59 or below	07	6%

Formal discussions with vocal music colleagues in the fine arts department during the course of scheduled staff meetings, further proved that the problem was district wide. Music teachers noted a strong level of dissatisfaction in their ability to communicate the language of music in a way that significant reteaching was not necessary. Some felt that the review time was so time consuming in a subject that is accorded so little time, that the students would be best served by having this one area of the curriculum be

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eliminated until fifth or sixth grade. Others wished to eliminate octavo reading as part of choir training replacing it completely with song sheets.

These thoughts would follow the Piagetian theory which notes that effective learning will not take place, if the material being presented is not able to be accommodated by the child, due to his or her developmental level (Kamii, 1973). The writer maintained the importance of the unit on music fundamentals, but determined, based on Piagetian thought, that the methodology and objectives used to teach this subject needed to be modified, so that there is a match between what is expected and the child's stage of development.

Evidence was also seen in the manner in which students utilized choral music in sixth grade. Students consistently ignored written music directions, such as repeat signs, dynamic markings, and tempo instructions. Little heed was paid to the movement and direction of the printed notes.

Causative Analysis

The problem of students not mastering skills in music reading and writing has many causes. One factor is an appropriate match of objectives to the cognitive level of the student. Teachers must be able to assess correctly the level of development of the students. Mismatching the objective to that level will lead to a high probability of failure. Those who write objectives must keep in mind the fact that music is a performing art. Should those

objectives not engage the mind (and often the body) of students in a way they feel they actively participate, retention, as well as interest may not occur.

One cause that was quickly dismissed was the idea that the district general music curriculum in the area of fundamentals is not matched to the grade level of the students. It was found that the music curriculum guidelines were created with an expectation level below that which was evidenced when the writer compared the level of cognitive development of his students to that expected by the authors of three contemporary music texts. Such signs of development, from a musical standpoint, included the ability to translate symbols, to identify the styles of music and to be able to read choral music.

The short amount of instruction time was also a factor in the lack of retention. Students are scheduled for one weekly 40 minute period of music. Accounting for holidays, assemblies, teacher absenteeism, and emergencies, the average number of classes for the 1989-1990 school year was only 33. This one week (or greater) interval between instruction time led to a natural breakdown of recall.

Along with low priority accorded the fine arts is the fact that the district uses a modified grading system for final averages in music, art, gym, computers, and library classes. Whereas the so-called academic areas are evaluated with "A-B-C-D-F," the "special subject areas" are only allowed to grade with "O" (Outstanding) "S"

(Satisfactory) "NI" (Needs Improvement) and "U" (Unsatisfactory). Preadolescents may lose interest in a subject when they envision the weakness of this system. Unlike other classes, neither poor work grades nor poor behavior grades can prevent them from being promoted.

Finally, teachers were not found to utilize principles of technology as alternate methods for the teaching of music reading and writing. All of the music teachers in the district teach this topic much the same way it was taught to them, with staff paper and pencil. There is little student performance, except the occasional unison class repetition of rhythms and meter patterns.

Relationship of the Problem to the Literature

Retention

Retention in the area of fundamental of music skills has been the object of research. Authors have proposed various causes leading to this lack of mastery and retentiveness. Upitis (1987) attributes this to the fact that music instruction time is given a lower priority than math or language acquisition time. The writer's situation corroborates this; the average instruction time is only 22 hours for the entire school year.

The small amount of teaching time makes it difficult, even under the best of circumstances, for children in the concrete

operational stage to effectively new ideas into their current framework of learning and experience (Sinclair, 1973). To aid in the retention of any material learned over a long period of time, researchers have noted the use of reinforcement techniques (Hunter, 1986; Abeles, Hoffman & Klopman, 1986; Cummings, 1980). Reinforcement makes it possible for students to grow and improve (Hunter, 1986). One theory of retention notes that when students forget something it may be that their retrieval system has not functioned (Abeles et al. 1986). The authors reported that memory is composed of two critical parts: recoding (which moves short term memory into long term memory) and retrieval (the main reason for long term memory). To improve the retrieval factor, retention cues have been shown to be an effective tool (Abeles et al., 1986; Shehan, 1987; Phye & Andre, 1986; Casanova, 1987).

Retention and Music Fundamentals

For the preadolescent, a combination of visual and aural strategies is most effective in the mastery of rhythm reading (Shehan, 1987; Casanova, 1987; Berliner, 1987). Performance repetition of rhythm patterns has been seen to improve short term memory, while also increasing memory capacity (Slodoba in Shehan, 1987).

Mnemonic devices, like the hand symbols devised by Zoltan Kodaly, (a Hungarian composer and music educator) can be propitious in the maintenance of quick recall (Phye & Andre, 1986).

Two of the most common devices used in organizing material for retrieval are that of acronyms and memory sentences. Two common musical cues are the mnemonic devices used to teach the note names of the treble clef staff. (To show the names of the four spaces, it is customarily taught that *FACE* rhymes with *SPACE* while the sentence *Every Good Boy Does Fine* or the more humorous *Empty Garbage Before Daddy Freaks* is oft used to teach the letters *EGBDF* on the five lines.)

Whatever method used, authors have repeatedly noted that the material must be meaningful to the student as well as have utility (Cummings, 1980; Sinclair, 1973). Neither children, nor adults will retain information that seems useless. Sinclair noted that schools are traditionally concerned with information, not the process of interaction and creativity.

For the music fundamentals class, merely memorizing the symbols without the purpose of creating an original work, will retard retention. Students, whether in elementary school or in college, are often asked to learn the rudiments of music without a concrete usage. Unless students are actively participating in a musical creation, they will lose interest (Davies, 1976). This creation may be as simple as the repetition of a simple rhythm pattern or a complex as a performance of an original work for orchestra.

Matching the Piagetian Level to the Learning

Pask's study (Pask in Entwistle, 1981) suggested that the teaching style must match the learning style regarding structure. He found that students performed creative exercises better when presented in a non-directed manner by a teacher not afraid to be creative.

Several authors (Phye & Andre, 1986; Kamii, 1973; Wohlwill, 1981; Abeles et al., 1986; Hullfish, 1972; and Davies, 1973), have written on the subject of how mismatching the Piagetian level of development to the objective begin stated is a major cause of the lack of retention. For most students in the practicum, appropriate tasks would be at the concrete operational stage. Students at this age, according to Piagetian thought, would have already begun conceptualizing small abstractions, while beginning to understand conservation.

In music, this would be demonstrated by showing that the two musical phrases  and  are equal in the amount of beats they possess. Should the child understand that  =  , he has demonstrated an understanding of conservation (Abeles et al., 1986). The authors followed that designed objectives for this age child should challenge with rhyth questions demanding the use of conservation.

Wohlwill (1981) demonstrated that conservation also can be seen in music as children learn that a repeated melody has not been altered, although it may sound different due to a modification in harmonies or rhythms. Whether being able to identify auditorily

that a melody is unchanged, although the instrumentation may be modified or comprehending the relationship between quarter and eighth notes, students evince their capacity to conserve by moving their schema to a new stimuli, thereby causing learning. J. McVicker Hunt termed this ability "the concept of the match" (Hunt in Wohlwill, 1981).

At this stage of development, students have the capability to classify as well as use simple abstractions, such as musical symbols. For example, the upper elementary level music student can be taught to differentiate between the dynamic markings *p, mp, mf,* and *f.* Associativity can also be seen when students rearrange a set of notes to create equal amounts of time (Phye & Andre, 1986). The student who can master the rudiments of musical composition, (Hickok & Smith, 1974), has proved success in the use of logical thought, based on the knowledge that they have shown the ability to both encode and decode symbols. Phye & Andre (1986) noted that classification and structurization are crucial in the mastery of concrete operations.

The Use of Bloom's Taxonomy in Creating the Match

Along with matching the objective to the appropriate Piagetian level, the higher levels of Bloom's taxonomy of educational objectives must be used (Hunter, 1986) if we are to expand student thought. Teaching at the lower levels was seen to be a cause of poor retention, as well as a possible retardation of movement

toward abstractions and formal operations. Davies (1973) wrote that most low level objectives are uninteresting and therefore limit student retention. The author suggested that without concrete usage, rudiments of music are valueless. In the Piagetian mode, according to Kamii (1973), it is active learning that is the crucial factor is helping children move from the concrete to the abstract. Active learning is accomplished by a teacher who helps a child learn by guiding experiences, which are appropriate, yet challenging to their level of cognition.

When one looks at the entire curriculum, in terms of its testing instruments, as measured by Bloom's taxonomy, a music educator can see how teaching at low levels of the taxonomy may hinder retention (Abeles et al., 1986). The practicum writer has recreated several examples of the classic taxonomy as applied to the testing of fundamentals:

1. Music in three pulses would be considered:a)duple rhythm, b)triple rhythm, c)quadruple rhythm.

2. Listen to the following selection. Is the meter: a)duple rhythm, b)triple rhythm, c)quadruple rhythm?

3.Listen to the following selection of music. Which piece of music would not be appropriate for music in a movie if the scene being described was a waltz in a palace? a)Music#1, b)Music #2, c)Music #3

Question 1 used the level of knowledge, question 2 demonstrated analysis, whereas question 3 demanded evaluation (Abeles et al., 1986). The information in question one may be filed

in short term memory. While question two demanded the use of comprehension, the final question made use of several lower levels to reach the level known as evaluation. The authors noted that students may remember more if they knew they would have to use information in a variety of ways. Poor retention is seen more often when students are not actively involved in the learning. The authors cited that Bloom originally prepared his taxonomy as a method of evaluation for curriculum and objectives.

Berliner (1987); Hunter (1986); and Davies (1973), noted that retention is improved when students are actively involved in the material being taught. Colwell (1970) wrote that music educators may not be as concerned as their colleagues in other disciplines in accountability and testing. Should that thesis prove true, mastery is best accomplished by the prudent use of Piagetian thought combined with planning to insure objectives use higher levels of thought along with active participation.

Causation of the practicum problem, therefore, is a result of incorrect teaching styles. Teachers who a) understand retention theories, b)use techniques which pair teaching style to that of the learner, and c) match multi-leveled objectives to his or her stage of development will aid in the retentive process.

CHAPTER III

ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS

Goals and Expectations

There were two major goals of this practicum. The first was to ascertain, through a review of the literature, the most effective way to increase retention in the learning of music fundamentals. The second was to implement that strategy, by demonstrating the material taught is retained and used in the construction and performance of music.

Before delineating specific objectives that demonstrate the success of the practicum, the reader would be well served by a short definition of the term *fundamentals of music.* Fundamentals of music may be considered the first steps in learning how to read, understand, and manipulate the symbols and elements of the language of music.

Outcome Objectives of the Three Month Implementation

The following are the outcome objectives that were projected for this practicum:

Objective 1: By the end of the three month implementation period, 75% of all students will demonstrate mastery of the daily objective by receiving an average grade of 80% or higher on the classwork assignment given that day. These assignments are delineated in Appendix C. Each one is related to a section of the instrument (Appendix B) used to delineate the problem.

Objective 2: During the three month implementation period, 75% of all students will bring to class the previous session's notes on the music paper provided. (This objective will validate notation as seen in #6 of Appendix B.)

Objective 3: By the end of the three month implementation period, students will demonstrate the ability to read rhythms by performing unison rhythm patterns with the class. This will be done with clapping, Kodaly symbols, or with the use of rhythm instruments. (These will prove mastery of rhythm reading as seen in #5 of Appendix B.)

Objective 4: By the end of the three month implementation period, students will demonstrate the ability to recreate the sequence of the keys of the piano, by designing a paper keyboard of their own.

Objective 5: Before the end of the three month implementation period, each student will come to the front of the room, and with the aid of an overhead projector, correctly answer as well as explain to tne class two out of three problems related to rhythm or melody. (This objective is related to #2, #3, and #5

of Appendix B.)

Objective 6: By the end of the three month implementation period, 75% of all students will demonstrate the ability to read the notes of the treble clef staff from c^1 to g^2, by finding ten words that only use the letters A-G, and writing pitches above the letters of those original words. (This objective is related to #4 of Appendix B.)

Objective 7: By the end of the three month implementation period, 75% of all students will show mastery of the early steps of fundamentals by composing an original eight measure piece of music in 4/4 time comprised of the proper amount of beats per measure, having the letter names of the notes written under them, and possessing a neat calligraphic style in the writing of treble clef, bar lines, and notes. (This relates to the free composition exercise, #6, of Appendix B.)

Objective 8: At the close of the three month implementation period, 75% of all students will show expertise in the writing and reading of elementary fundamentals of music by receiving a grade of 75% or better on a teacher designed instrument.

Objective 9 By the close of the three month implementation period, members of the music education staff will report greater enthusiasm on the part of their students, during the unit on music fundamentals. This will be evidenced through written reports or verbal comments shared at the district fine arts meetings.

Objective 10 By the end of the three month implementation period, members of the practicum writer's chorus will be using

their choral octavos not only to learn and rehearse the words of a musical work, but also to learn and rehearse non-textual elements, such as pitch and music directions. Students will show evidence of their note reading ability, by answering musical questions, based on the choral sheet music.

Measurement of Objectives

The measurement of all objectives was based on a total of 88 students. Objective one was measured by the grading of daily assignments (see Appendix C). These assignments were aligned with the daily objective, which was to be stated at the beginning of each lesson.

Seventy-five per cent of the students were to demonstrate mastery of that objective by receiving a grade of "B" or higher on the classwork assigned that day.

Objective two was measured in the beginning of each lesson by checking to see which students had brought their music (staff) paper, with the music notes from the previous class. Seventy-five percent of the 88 students involved demonstrating accountability was considered satisfactory for meeting the objective.

Objective three was measured by student participation. There were no individual performances; active participation was the key, even at the expense of individual incorrect responses. The object here was to involve all students in an attempt to translate music notes into some form of physical response. That response

was in the form of the verbalization of Kodaly rhythm symbols (see Appendix D), rhythm clapping, or the use of rhythm instruments. To this end all students in each class must have shown involvement be involved in order to consider meeting the specific objective.

Objective four dealt with the student creation of a keyboard. Students were responsible for the design materials for their keyboard as well as the actual construction of that keyboard. The keyboard must have included two octaves with the correct configuration of black and white keys. The notes of one octave must have been named. The objective was considered mastered if 75% of the 88 students in each class handed in the assignment on time with no errors.

Objective five called for students to demonstrate their individual learnings in front of the class. With the use of an overhead projector, students were to answer at least three questions during the three month period. Each time a student was called to answer a question in front of the room, that student was responsible for an explanation as to how that answer was formulated. (Examples of problems can be found in Appendix E). Correct responses were publicly rewarded with extra credit. The objective was considered met when each student had three chances to receive this extra credit.

Objective six involved mastery of the names of the notes of the

treble clef staff from middle C (c^1) to the note G that sits atop the staff (g^2). Mastery was shown when students either encoded or decoded ten words of their choosing that used only the letters A-G. These words and their accompanying pitches must have been successfully written on the staff (music) paper in the child's notebook (see Appendix F for examples). Students were afforded 15 minutes of their music period for the completion of this task. Successful meeting of the objective was accomplished if 75% of the students correctly decoded or encoded ten words.

Objective seven was measured by the evaluation of an original student composition. This composition was one of the culminating activities of the unit on music fundamentals. The composition was judged to have met the objective if it had no more than three errors in either melodic notation, rhythmic notation, or informational notation. The objective was considered to have been met if 75% of the students fulfilled the above criteria in terms of notation and allowable errors. The students were allowed 20 minutes of their music period for the completion of the free composition. These original compositions were not artistic creations to be designed inside a vacuum. Each new song was played by the writer, or when possible, by the student composer, for the enjoyment of the class. Students were free to use any melody instrument they choose. In the past, this activity had been shown to have a most favorable response by students.

Objective eight involved the exam for the yearly unit on music

CHAPTER IV

SOLUTION STRATEGY

Discussion and Evaluation of Possible Solutions

Mastery of music reading and writing skills in the area of fundamentals of music is not being accomplished due to the fact that students are not retaining the skills which they have been taught. The literature offers some strong tested solutions. These solutions will be discussed, followed by a detailed appraisal of each, as it applies to the practicum situation.

Increasing Music Instruction Time.

Upitis (1987) noted that more frequent music instruction time would aid in retention. The author proposed that music classes should be equal in length to that of math or language arts classes.

Teaching Retention Skills

Berliner (1987) suggested that retention can be improved through the actual teaching of memory skills. He believed that only 10% of teachers now share with their students those strategies which aid in memory development. It was noted that organizational methods such as task analysis were found to be

fundamentals. This instrument, created by the writer, can be found in Appendix G. Students were afforded 25 minutes for the completion of the exam. The grade from this exam was tabulated along with the daily assignments and extra credit responses. The exam was graded using a traditional 0-100 score. Mastery was seen to be accomplished if 75% of the students received a grade of 75% or better.

Objective nine involved comments by the writer's music education colleagues. A written survey, as well as oral responses at the fine arts meeting that coincided with the third month of the practicum were evaluated. Positive responses regarding improved retention were shown to demonstrate success. Music education personnel noted that children enjoyed using the computers as part of their weekly classes. Because the children were somewhat familiar with the manipulation of the computers, the music teacher was not compelled to teach introductory lessons on computer manipulation.

Objective ten, the final objective, involved the response of choral members. In the past these students have shied away from the reading of notes of a choral octavo, instead reading only the words. An informal survey of those choral students involved in the practicum determined if these students were, after the three months, looking more at the music notes of the octavo, than they were at the onset of the practicum. Success was seen to be determined if a majority of those students, reporting through an

informal show of hands, that they read equally both the words and music.

more widely used by those students who understood and used the retention cues taught in class (Hunter, 1986; Berliner, 1987). However, any solutions (such as mnemonic devices, choral chanting, acronyms, etc.) which aided in retention were considered to be effective (Davies, 1973; Hunter, 1986; Abeles et al., 1986).

Matching the Teaching Style to the Learning Style

Several authors reported that the difference in learning styles of children must be evaluated before we can affect changes in retention. Entwistle (1981) and Kogan (1976) found greater success when teaching style matched learning style. The student who was found to be methodical should be taught by a highly structured teacher, while the student who was impulsive should be allowed to grow in a more relaxed environment.

Abeles et al. (1986) noted that one of the current trends in American education is the move toward accountability. From this movement has come Competency Based Education (CBE). CBE concerns itself with the product, with the realization that students work in different ways. While the product is the ultimate goal, the process, (as mentioned by Entwistle and Kogan) is now also under scrutiny.

Stressing Creativity

Upitis (1983) described the power of creativity in increasing retention. She noted that students must be encouraged to make

their own music (be it banging on drums or creating their written musical language) from the earliest years. The author noted that these activities should be continued, in the elementary school years, by allowing time during the school day for students to create their own melodies and musical codes.

Wiggins (1989) reported that because children are naturally creative, composition would be effective for building musicality as well as fostering self-worth. The author agreed with the fact that learning styles are important, but concluded that it was not the learning style, but the act of musical creation that should be the goal. That goal may come, he wrote, in the form of a song, an instrumental piece or a play.

Reviewing Music Education Training

Brand (1984) attempted to describe the qualities of a music educator. Not feeling that the art of musicianship is as well refined as many educator's teaching technique, the author brought into question the performance skills of music teachers. Music teachers who are not strong conductors and performers, the author felt, would be weak at affecting changes in learning the skills needed for the performing arts. These skills included the power to teach successfully the rudiments of fundamentals and theory.

The Use of Computer Based Instruction

In 1968, the Music Educators National Conference created a set

of recommendations to insure competency of teacher candidates as well as measure the performance of those already in the profession. The final report noted "They need to welcome and utilize technological, experimental, and exploratory developments in musical composition, teaching procedures and aids, (as well as) sound generating devices" (Klopman, 1972, p.12).

The work of behaviorists along with the aforementioned studies of learning styles, led to the development of programmed learning instruments as a possible solution for retention through reinforcement. While programmed texts are still in use, the most visible sign of their influence in education has been the use of computer based instruction (CBI). Computer assisted instruction (CAI) is equally discussed in the literature. However, for the sake of clarity, the writer has chosen to use CBI throughout his work.

Today, over 60% of U.S. public schools use computers either in the classroom or in computer labs (Feldstein, 1988). Some states, such as California, have gone so far as to mandate CBI into their statewide curriculums. This includes the use of computers in music education (California, 1985).

Authors have written the praises of CBI and its influence on raising retention levels. Abeles et al. (1986), Kulik and Kulik (1987), and Willett & Netusil (1989) all reported success with retention when computers were utilized. Instructional objectives were better defined (Kulik & Kulik, 1987), students felt a sense of

control (Taylor, 1987); and neither teacher nor student had to wait to have questions answered or tests graded (Willett & Netusil, 1989).

In Chapter II, this writer spoke of the need for a match between the Piagetian level of development and the objective being taught. As a teaching tool, the computer provides that link. Kamii (1973) stressed the need for active participation in the move from the concrete to the abstract. Computers provide students with a hands-on (active) experience. Because a computer lesson can be tailored to the appropriate cognitive level of each child in a given class (Willett & Netusil, 1989), the match between objective and learning level can be made more accurately than before.

Finally, three main Piagetian litmus tests of cognitive growth: conservation, classification, and structurization can all clearly be measured by the use of computer based instruction (Phye & Andre, 1986; Wohwill, 1981; Abeles et al., 1986). The computer allows the music student to create his or her compositions within the framework of traditional harmony (Newcomb, 1988). Each song is unique, but all possess the same rhythmic symbols (whole, half, quarter notes, etc.). Proper manipulation of these elements, with the goal of mathematically determining the exact number of beats in a measure, demonstrates success in these three areas.

Unlike traditional music performers, the student composer has the added advantage of always hearing a perfect performance of his work (De Loughry, 1987). Teachers no longer had to use the Kodaly

symbols ta-ta-tee-tee-ta when teaching  ; the computer would perform exact rhythms. Students have an immediate and exact play back of their works.

For the student, the computer raised the level of interest. The fact that most educational software's instant visual response is akin to video games is certainly not accidental. The research of Kulik & Kulik (1987) with 199 students concluded that CBI not only is effective in raising grades, but also the interest of students. They noted students learned more in classes with CBI: (a) exam scores were raised from the 50th to 61st percentile, (b) there was a 32% reduction in needed teaching time, and (c) students enjoyed their subjects more.

The above six solutions (a) increasing music instruction time, (b) teaching retention skills, (c) matching the learning style to the teaching technique, (d) stressing creativity, (e) reviewing music education training, and (f) the use of technology, specifically through computer based instruction (CBI) were the most common themes found in the literature for aiding in retention of fundamentals of music. Each will now be discussed for its possible efficacy in terms of the practicum setting and population.

Possible Efficacy of Increasing Music Instruction Time

The increase in music instruction time may very well be the most common sense solution to the problem, yet in terms of

practical adoption, it stood little chance of ever being tested in the writer's situation. The scheduling of music periods as contractual preparation time for teachers, along with the state mandated schedule for academics, has actually reduced music instruction time in the elementary schools of the practicum situation.

Possible Efficacy of Teaching Retention Skills

The second solution gleaned from the literature (teaching retention skills as part of the curricula) was felt by the writer to be a requisite part of standard teaching practice. The ideas presented, such as asking students to sequence items before working a problem and the use of visual cues (especially helpful for music students with auditory deficiency) (Casanova, 1987) were currently being utilized by the writer. The writer also used mnemonic devices in the teaching of musical note names.

Possible Efficacy of Matching the Teaching Style To the Learning Style

The third solution was based on Entwistle (1981) and Kogan's (1976) work on learning styles. The idea was also questioned in terms of the practicum situation. Although the research demonstrated success with serialist and holist learners (Entwistle, 1981), the writer's situation is that of heterogeneous groupings of approximately 30 students taught once a week for 40

minutes. Therefore, small group instruction was not deemed to be a practical solution. It should be noted, however, that the writer currently uses various modalities in teaching fundamentals (see Appendices A and C).

Possible Efficacy of Stressing Creativity

Stressing creativity as the major objective, the fourth solution gleaned from the literature, was also considered to be de riguer in the music education curricula. Although Abeles et al. (1986) and Upitis (1983) noted that creativity is essential to any music education program, the writer did not think that a strong enough case was made that using creativity will itself aid retention.

Had the use of objectives that stressed creativity led to student interest (a natural step toward retention), then the solution would be considered. However, as with the solution regarding learning styles, the writer felt that this method should already be one piece in the music teaching puzzle.

Possible Efficacy of Reviewing Music Education Training

The fifth solution was suggested by Brand (1984). The author proposed tightening music teacher standards as a method to more efficiently cause retention in areas which dealt with performance (such as fundamentals). The writer, besides holding the state required Standard Music Education Teaching License, grade K-12, earned a master's degree in choral conducting. He thought that this

solution was appropriate only to those districts where classroom teachers, certificated "Elementary Education" are responsible for the music education of their students.

Possible Efficacy of Using Computer Based Instruction

The sixth solution gleaned from the literature involved the use of technology, specifically computer based instruction (CBI). This critical area was repeatedly offered as a solution in the literature. Willett & Netusil (1989) reported that students who used computers had a more positive attitude toward learning in general. The writers postulated that besides providing students involvement, computers gave the children a sense of personal attention without distractions. This, in turn, leads to better concentration and retention.

Taylor (1987) further noted that if the software chosen is effective, students maintain their locus of control. While the direction may come from the computer screen, the response is student empowered. Abeles et al. (1986) noted that of the hundreds of studies done comparing CBI to traditional methodologies, most noted that CBI was shown to be as effective as standard teacher directed approaches (1986).

One cause noted in Chapter II was the possible mismatch of objectives to the individual's Piagetian level of development. Because computers can be programmed to teach at all levels of difficulty, a heterogeneous class could work in multi-levels

simultaneously. Each pupil can be afforded the level to which that student shows the most competency and greatest potential for growth (Feldstein, 1988; Placek, 1985; Willett & Netusil, 1989).

The idea of incorporating technology into the teaching day is further suggested by Feldstein (1988). The author noted that whereas some districts may opt for a performance-oriented electronic music lab, (including synthesizers, MIDI's and computers), other districts may just as easily find success using computers strictly for practice and tutorials. Although the practicum situation of the writer was not conducive for the creation of an electronic music lab, the computer lab in the writer's school was currently utilized for CBI in the areas of language arts and math instruction. The lab was available for this practicum situation.

Willett & Netusil (1989) noted that teachers today find computers to be popular as well as welcomed teaching tools. They cited three reasons for their popularity: (a) computers provide positive reinforcement, (b) they ask questions from the student's perspective, and (c) are similar to video games that most children play at home.

Privacy is also accorded to the slower child. Unlike textbooks, whose covers often vaguely disguise slow learners from those at a higher level, each student, regardless of his or her level, is given complete privacy. The literature has also dealt with how CBI can be especially suited for the subject of music fundamentals.

Rumery (1986) noted that music students relate using the computer to performing with an instrument, especially a keyboard. He wrote that "musicians have an affinity for computing. . . because of similarities in the thinking of music makers and computer programmers" (p. 99).

When students are learning to repeat accurately a rhythmic or melodic phrase, a computer will give the example precisely each time (De Loughry, 1987; Ehle, 1986A). Some programs, such as *Alfred's Practical Music Theory,* allow students to hear the melodies and rhythms on the screen, as they work at their own pace (Placek 1985; Thomas et al, 1986).

Each of the fundamentals taught by the teacher can be reinforced on the computer. These basics include: note-type identification, time signatures, metric construction, pitch identification and musical terminology. This further enhances the utility of using the computer as a tool in the teaching day.

Salisbury (1985), however, looked at the negative response toward CBI. He wrote that some teachers resent using CBI due to the fact that they relate the computer to an electronic practice machine. An erroneous connection is then made, he suggested, between the use of educational technology and teacher laziness. He suggested that some teachers perceive that computers will be used for no more than excessive drill and review that is boring and deleterious to the growth of retentive skills (Salisbury, 1985). This fear of using computers and other technological developments

can hinder a teacher's potential for reaching all students (Kassner, 1988; Manarino-Lettett & Cotton, 1985).

Because most districts are moving toward a multi-disciplinary curriculum (using technology in every subject), today's music teacher must be prepared to work with the tools of progress. However, most school districts, including that of the writer, still do not relate the teaching of music with the use of the computer (Ehle, 1986A).

Teachers expressed concerns about computers for other reasons. Some were uncomfortable with computers; they perceived them be a threat to their job security, while others were simply reticent to change (Manarino-Lettett & Cotton, 1985).

This attitude, however, is rapidly changing. In 1980, 90% of teachers in a survey, conducted by Stevens, felt uncomfortable with computers (1980). Yet by 1986, 85% of those surveyed, believed a computer was easy to learn (Manarino-Lettett & Cotton, 1985). Educators today have an obligation to (a) be aware of the operation of computers (such as keyboarding, nomenclature, handling of hardware and software, and commonalties of keyboard functions), (b) know the benefits and problems inherent in CBI, (c) understand the effect of computers in society and (d) be aware of the ways one can teach critical thinking skills via computers (California, 1985, p.8).

Today's computer hardware, as used in the music room or in the computer lab for CBI in fundamentals of music, is most often the

model Apple IIE or a similar IBM (Ehle, 1986B; Feldstein, 1988; Rumery, 1986). These computer manufacturers have produced what seems to be the most widely purchased machines for tutorials, testing and musical performance.

It is the software, however, that is the main concern of much of the literature. The Alberta report (1987) noted that few schools are purchasing new hardware; it is the software with which they are now concerned. Software can range from simple readings on the screen to complex interactive programs, inclusive of colored graphics and special effects. Newcomb (1987) called it "teaching automation" (p. 46).

Hullfish (1972) examined computer software in terms of thinking skills, as they apply to Bloom's taxonomy. He found that the programs can be divided into two types "response intensive" and "response sensitive." The former is concerned with correct, exact answers (recall in Bloom); the latter with open ended though provoking answers (synthesis and evaluation in Bloom). If not using the higher levels of Bloom's taxonomy is a cause of the lack of retention, the computer offers a viable solution since its questions come in many forms. While this study is 20 years old, it remains valid; much of today's software is interactive.

Compared to the fully developed industry of computerized musical instruments, software production lags far behind (Newcomb, 1988; Taylor, 1987). Both authors made a correlation between software which operates on the recall level of Bloom to

that of teaching machines. The music skills may be taught, but retention is limited since the higher levels of thought never enter into the material on the computer screen.

Most composing programs do not critique performances; they only allow the creation of original melodies. The writer of the practicum, however, encouraged originality at this age level, and believed that both Newcomb and Taylor's position demanded cautious analysis of all educational software to insure that more than recall is expected.

Although much software from the 1970's and early 1980's certainly did fit Salisbury's description of electronic teaching machines, today's manufacturers of software are taking into account learning theory. One such use of research in cognition is the understanding of the development of automaticity of subskills (Salisbury, 1985). He defines *automaticity* as the state where a new learning no longer demands the full attention of the brain. Examples cited are eating, driving and touch typing. One does them almost instinctively after a while, allowing for new learnings to occur while the above are occurring.

Salisbury reported that the only way a skill can become automatic is through practice. A skill must be taught for (1) mastery, (2) speed in performance, and (3) the ability to perform the skill while engaged in another. Retention would be greatened, because the new skill demands less effort. The computer, he felt, is an efficient tool in developing automaticity.

Like any teaching tool, not all software will aid in retention. In a rush to appear current, teachers must be careful that they do relinquish selectivity for the sake of novelty. Does the software undergo the same scrutiny that textbooks do (Chopp, 1986; Placek, 1985)?

When appraising this wealth of software on the market, some things to consider are: creativity, clarity of instructional objectives, user friendliness, teacher documentation and teacher utility (Leonard & LeCroy, 1986). Comprehensiveness and sequencing of material was also considered a priority (Rumery, 1986). The software should be simple to use and come with tutorials, thus requiring no computer expertise on the part of the instructor (Ehle, 1986B).

In measuring which software would be most effective in increasing retention, teachers must look beyond the glitz and colored effects to find the efficacy of the product. The best programs must be educationally sound, following demonstrated uses of developmental theory (Maddux, 1989; Ehle, 1986A).

Two pieces of software recommended by the writer are the previously mentioned *Alfred's Practical Theory* (Alfred Publishing) and *Music Fundamentals* (Silver Burdett). *Alfred's Practical Theory* is a three unit, six diskette set. Beginning with the simplest creation of music symbols, it continues into advanced theory. The writer has found success with the disks as well as the

accompanying workbook. One strong benefit of the product is its utility from elementary school level through college.

Silver Burdett's *Music Fundamentals* is a three disk set whose emphasis is for lower and middle elementary aged music students. Two unique features of this system are the musical stick figure who appears on the screen with a smiling or sad face and the optional (though necessary) keyboard overlays. These plastic overlays sit atop the keyboard and form the design of a piano. Computer keyboarding is reinforced, while children learn the rudiments of piano performance.

Finally, teachers must be reminded that CBI was not meant to replace human teachers; it was created as an alternate learning modality (Placek, 1985). Although CBI can be as effective as standard teacher-directed learning, it does fall short in the successful introduction of new materials (Abeles, et al., 1986). The computer, it has been shown (Willett & Netusil, 1989) helps the students to learn that which they learned in the classroom. It gives them practice-oriented forms of music, allowing time the teacher to discuss art and aesthetics. Computers provide individual paced learning, enabling the student level to match the objective (Kassner, 1988; Feldstein, 1988; Tessmer, 1984; Thomas, 1986).

Technology must be one piece in the entire educational puzzle (Abeles et al., 1986; California, 1985; Kessner, 1988; Willett & Netusil, 1986). The best software available, is only a supplement

to the entire curriculum. "We need to have a sense of balance and perspective and knowledge about what works best when using technology" (Kassner, 1988, p. 20). Although some teachers may still have an aversion to technology, research has overwhelmingly shown its efficacy in increasing student interest, matching the student to his developmental level and therefore must be considered a viable solution to the problem of increasing retention in the field of music fundamentals.

Description and Justification for Solution Selected

After reviewing the above solutions, the writer determined that using technology, specifically computer based instruction to teach music fundamentals, would be the most effective solution. The writer came to this decision after analyzing the wealth of literature on the subject, tempered with his judgement of implementation feasibility in the practicum situation.

With traditional teacher-based instruction retained as the main classroom procedure, the writer felt that CBI could be a useful addition in helping reduce reteaching time and increase memory of music reading and writing skills.

The cause of the problem, teaching objectives not matching students' appropriate developmental growth, could be remedied with multi-level, interactive computer software that is used as ancillary instruction to the classroom situation. The software selected would reinforce each objective listed in Chapter III from

the use of rhythm drills, to the fingering of piano keyboards.

Report of Action Taken

Implementation of the solution strategy began after receiving approval in August, 1990. The writer began to meet with district administrators during the summer to arrange a schedule that would allow certain general music classes to be taught in the computer labs of the elementary schools. The writer was also in contact with the district supervisor of fine and performing arts to plan for an October inservice meeting, where the writer would introduce his colleagues in music education to the rationale and use of computer based instruction for the teaching of music fundamentals. It was decided at that time to have the writer be responsible for the creation of a new unit on technology in the district music curriculum.

The writer experimented with various pieces of software to determine which would be the most efficacious for a positive practicum result. The following disks were tried: *Alfred's Practical Theory* , published by Alfred Publishing and *Music Fundamentals,* published by Silver Burdett. Each was purchased for use on Apple computers. .

Each school in the practicum location has a computer lab with 14-16 computers. The district is gradually upgrading these labs to include only Apple 2GS computers. However, at the present time, three out of five still have older Franklin Ace computers. While

these computers are Apple compatible, they possess limited 64K memory.

The writer decided to chose *Music Fundamentals*, over *Alfred's Practical Theory*. While *Alfred's Practical Theory* was an effective method for teaching theory, it had several drawbacks. For one thing, even the usage of the entire Volume 1 (there are three) was considered too difficult for this grade level. While the thrust of the practicum was to use the computer as an ancillary teaching tool, not a replacement for traditional teaching, *Alfred's Practical Theory* involved too much pre-teaching on the part of the writer. The material presented leant itself more to review than to primary learning.

Music Fundamentals, however seemed to make the match between the needs of the writer and the cognitive level of the students. Like *Alfred's Practical Theory, Music Fundamentals* is also in three volumes. However, this courseware could be mastered by sixth graders. It's graphics were lively, it possessed color, which *Alfred's Practical Theory* did not, and perhaps, most importantly, it progressed at a pace where the writer could be used to review and represent material that the student, themselves, mastered at the computer keyboard.

One unusual, yet creative facet of this software, was the fact that students were given soft plastic overlays, which were placed on their computer keyboards. Via white and black dots on the overlays, the coverings simulated the piano keyboards. By the end

of the first of the three volumes, students were expected to be able to read the notes of the treble clef staff and play them on their "keyboards".

With the software chosen, the usage of the computer lab arranged, and the permission of both principal and music supervisor given, the practicum was scheduled to begin with the opening of the school year. Four classes were chosen to be in the practicum. The total number of students involved with the practicum was 88. Table 2 lists the size of each class involved with the practicum.

Table 2

Number of Students in each Class Involved in the Practicum

Total number of students in practicum - 88

Class	Number of students per class
A	22
B	23
C	21
D	22

Implementation of the practicum commenced with the second music class of the year. Children were given the teacher designed instrument (Appendix G). They were told the results would not count and even if they could not answer one question they were to try. They were informed that they would be given the same test in about three months and that the writer was sure they would do much better the second time.

Students were told they would have music in the computer lab for the next few months. The students seemed excited, however several said that couldn't understand how they could learn music with computers. The lab in the writer's school was arranged with 14 terminals, each set in front of two chairs. As the average class size was 22; there were several students who worked alone. The writer loaded the software into the network, which sent the program around the lab to all 14 screens.

It was during the first meeting in the computer lab, that the writer encountered two difficulties, which plagued the practicum throughout implementation. Firstly, the particular program took almost six minutes to be loaded onto all 14 screens. (Other programs tried, although inferior in quality, took one to two minutes.) Secondly, two the 14 computers were more often broken than not, causing children to be moved from their assigned seats.

As the first half of the practicum period progressed, the

students fell naturally into the following routine.

1. A five to seven minute review of the previous class material was conducted, while disk information was being sent throughout the network of 14 computers. The writer collected any homework that was due and checked for notebooks.

2. Students were reminded of the particular lesson on which they were working during the last class. As noted previously, CBI allowed the students to work at their own pace. Each student asked for his or her own lesson through their keyboard. The students worked for approximately 25 minutes. During this time, the writer circulated throughout the lab, both noting the progress of students, and assisting those with questions.

3. The lesson concluded with a five to eight minute review of the material covered by the majority of students. Children were encouraged to participate at the blackboard. Finally, students were told of any homework that might have been given.

Disk one of *Music Fundamentals* was finished by the end of the sixth week. A game was used to review the material taught thus far. Students were informed of an upcoming mid-unit exam.

The questions used on the exam were similar to those in Appendix E. As the reader can see, the mid-practicum test netted extremely poor test results (see Table 3). More than half received a score of 40% or below.

Table 3

Students' Scores for the Mid-Unit Exam

n = 88	
Grades	All classes
100%	14
90%	3
80%	4
70%	8
60%	8
50%	2
40%	9
30%	9
20%	19
10%	9
0	3

The writer speculated that the poor grades may have been due to each or both of the following extraneous causes: (a) students did not take seriously, the grading of the subject of music, because grades were usually based solely on participation in the lower elementary schools, (b) not enough time was spent in the computer lab on teacher-based development and review of material being covered. To test these ideas, the writer (a) sent home notes to parents of all students whose work habits were poor and (b) increased the review and recap time to upwards of 20 out the 40 minute period.

By the beginning of the third month, students seemed to be responding more favorably. Correct answers were more often seen and the amount as well as quality of homework had improved.

The second half of the practicum period dealt with the subject of rhythm. This was a bit a problem, in the use of the software, because the computer instruction demanded that the student tap rhythmic patterns to the produced "beat" of the computer.

This "beat" was a soft electronic pulse. Hearing it was necessary to the matching of rhythm patterns and therefore success with the program. The problem occurred when 12 "beats" (from the 12 terminals) began to be heard simultaneously. Listening to the "beat" that the computer gave was a difficult task unto itself. Students were constantly being reminded to be silent when they worked, a formidable task for any pre adolescent! It was not an uncommon sight to see students pressing their ears up to the speakers of the computers to hear the tones needed to perform the tasks required by the computer. Several students reported a sense of frustration in the fact they were not able to distinguish the tones eminating from their computer from that of their neighbors.

The writer realized that any music software chosen must also be evaluated for the amount of noise it generates, both by itself and multiplied in the surroundings of a computer lab.

The practicum concluded with both a review of all material

covered during the previous 11 weeks. The review was conducted using traditional, non-automated assistance. The practicum concluded with the administering of post test (see Appendix G).

CHAPTER V

RESULTS, DISCUSSION, RECOMMENDATIONS, AND DISSEMINATION

Results

The problem that existed in the writer's work setting was that sixth grade students were not retaining the material taught to them in the area of music fundamentals. The causes of the problem were that students were not being allowed to work at their own level, teachers were not making the match of individual level of cognition to the lesson's objective, and that teachers were not using alternative methods of teaching to aid in retention.

The solution to the problem was to use computer based instruction as an supplementary teaching methodology. Students were taught how the computer lab could be utilized, not only for their math and language lessons, but also for helping them to learn music. The writer felt that students would be able to work at their own pace, see immediate positive reinforcement, while enjoying the visual aspect of the computer graphics. The rapid feedback and familiarity with video games, the writer felt, would aid in the retention of the melodic and rhythmic rudiments of music.

The goal of the practicum was to design, from information gained from the literature review, the most effective way to increase retention in the learning of music fundamentals. To that end, 10 objectives were designed to measure the attainment of that goal. What follows is a restatement of those objectives and a description of the level of success achieved in each: All results have been rounded off to the nearest .10.

Objective 1: By the end of the three month implementation period, 75% of all students will demonstrate mastery of the daily objective by receiving an average grade of "B" or higher on the classwork assignment given that day. These assignments are delineated in Appendix C. Each one is related to a section of the instrument (Appendix B) used to delineate the problem.

Assignment #5 of Appendix C was used to measure the objective. The task was the creation of an original eight measure melody. The objective was considered met. One problem encountered with all classwork and homework assignments was the fact that a number of students in each class either forget or chose not to do the out of class work. Those who refused to do their homework received the grade of zero. Table 4 summarizes the grades of all students.

Table 4
Student Grades For Creation Of an Eight Measure Melody

n=88	
Grade	Number of Students
100	46
90	9
80	10
70	2
60	1
50	1
40	1
30	2
20	3
10	0
0	14

Objective 2: During the three month implementation period, 75% of all students will bring to class the previous session's notes on the music paper provided. (The objective will validate notation as seen in #6 of Appendix B.)

This objective was measured by the writer taking a moment or two at the beginning of the lesson and asking the children to hold up last week's notes. Each student was monitored for possession of the notebook. After three months, 82 out of 88 students who entered the class carried their music notebook. Table 5 summarizes the results.

Table 5

Students Attending Music Class with Their Notebook

Total number of students in practicum - 88

Class	Students with notes
A	21
B	20
C	19
D	22

Objective 3: By the end of the three month implementation period, all students will demonstrate the ability to read rhythms by performing unison rhythm patterns with the class. This will be done with clapping, Kodaly symbols, or with the use of rhythm instruments. (These will prove mastery of rhythm reading as seen in #5 of Appendix B.)

This objective was considered met because all children in each of the four classes attempted rhythmic clapping or chanting of the Kodaly symbols. The goal of the objective was active participation, not perfection in note reading. Performance skills were not measured. The odd off-beat clap or chant was immediate response enough for the poor student whose group effort suddenly turned into a solo!

Objective 4: By the end of the three month implementation period, students will demonstrate the ability to recreate the

sequence of the keys of the piano, by designing a paper keyboard of their own.

Children created keyboards of all sizes and colors, the biggest being over two feet long. (The writer decided to use it for a visual aid, by taping it to the chalkboard for each class to see.) The objective was not considered met, due to the fact that 22 of the 88 students chose not to do the assignment.

Objective 5: Before the end of the three month implementation period, each student will come to the front of the room, and with the aid of an overhead projector, correctly answer as well as explain to the class two out of three problems related to rhythm or melody. (This objective is related to #2, #3, and #5 of Appendix B.) The objective was measured by "Pass" or "Fail". Three attempts in front of the room, regardless of their correctness, would garner the grade of "Pass".

This objective was a success, as the writer assured that each child was given three turns to perform in public. Those students who needed assistance were given prompts to guarantee success, as well as provide immediate positive reinforcement.

The teacher used an overhead projector, with colored markers. Children were given the freedom to choose their own color. Because children not only enjoyed using the colored markers and projector, but also realized that this was not a graded activity, no student refused to be a "student teacher."

Objective 6: By the end of the three month implementation

period, 75% of all students will demonstrate the ability to read the notes of the treble clef staff from c^1 to g^2, by finding ten words that only use the letters A-G, and writing pitches above the letters of those original words. (This objective is related to #4 of Appendix B.) Twenty students in each class, or a total of 66 students were to complete the assignment for it to be considered met.

The objective was considered met. Seventy seven out of eighty eight students completed the assignment. Only 11 students did not perform the assignment. Table 6 summarizes the results.

Table 6

Number of Students who Completed Note Reading Assignment

n=88	
Completed assignment	Did not complete assignment
77	11

Objective 7: By the end of the three month implementation period, 75% of all students will show mastery of the early steps of fundamentals by composing an original eight measure piece of music in 4/4 time comprised of the proper amount of beats per measure, having the letter names of the notes written under them,

and possessing a neat calligraphic style in the writing of treble clef, bar lines, and notes. This relates to the free composition exercise, #6, of Appendix B. (Correctly answering this test question in Appendix B fulfilled the requirements for assignment #5 of Appendix C.)

This exercise required manipulating several learned skills. Students were asked to demonstrate their knowledge of time signatures, note values, bar line placement, as well as basic notation calligraphy. As noted in Table 4, 74 students completed the assignment.

Objective 8: At the close of the three month implementation period, 75% of all students will show expertise in the writing and reading of elementary fundamentals of music by receiving a grade of 75% or better on a teacher designed instrument.

This instrument, also known the post test, (see Appendix G) was a culminating activity planned to evaluate the progress of students during the practicum period. Students were required to demonstrate competency, not only in the area of rhythm and note identification, but also in the area of recognition of piano keys.

As with other items, scores were rounded off to the nearest 10. However the post test afforded students the chance to receive extra credit, up to 20 points for the identification of note names in problem number 6, Appendix G. The objective was met with most students receiving some extra credit. The writer noted, however,

that students performed only slightly better on the instrument than they did before computers were introduced. The objective was not considered met because only 58 students received a grade of 75% or higher. Table 7 summarizes the results of the post test.

Table 7

Students Grades for the Post Test on Music Fundamentals

	n=88	
Grades	Number of students	
100%	28	
90%	12	
80%	18	(75% or better)
70%	12	
60%	4	
50%	3	
40%	4	
30%	1	
20%	4	
10%	2	
0%	5	

Objective 9 By the close of the three month implementation period, members of the music education staff will report greater enthusiasm on the part of their students, during the unit on music fundamentals. This will be evidenced through written reports and verbal comments shared at the district fine arts meetings.

An evaluation of the workshop on computer usage given by the writer showed unanimous approval of the music education faculty

who attended the inservice demonstration. Approval was based on verbal comments to both the writer and the district fine arts coordinator stating that the staff member would be interested or has found success in using computers to teach music.

Objective 10 By the end of the three month implementation period, members of the practicum writer's chorus will be using their choral octavos not only to learn and rehearse the words of a musical work, but also to learn and rehearse non-textual elements, such as pitch and music directions. Students will show evidence of their note reading ability, by treating the octave as a piece of music, not merely a song sheet with notes.

An informal show of hands of those chorus members who were in the four practicum classes demonstrated that a majority of these students were now looking more at the actual notes than they did before learning music with the computers. Comments included references to the fact that choral music now seemed easier to read.

Discussion

The majority of the practicum students responded favorably to the learning situation of the computer lab. Some expressed disappointment that no singing was done, and others resented having to do homework, after using the computer.

While most of the objectives were met, the writer feels that the practicum leaves several questions unanswered. These issues

are presented as implications for future research in this area. Issues, such as the importance of music in the school curriculum, and the use of grades for the arts need to be addressed.

The writer is not certain that the subject of music is considered academic by parents. Should this assumption prove correct, the resultant effect may be that those students involved in the practicum often did not complete their assignments because their parents imparted no significance to their report card grade in the fine or performing arts. This would account for the high rate of students who chose to fail, rather than try certain aspects of this practicum.

Further work clearly needs to be done on the importance of the fine arts in the total academic curriculum. The writer felt that because the fine and performing arts classes are used as preparation time for classroom teachers, these "special" subjects are automatically delegated the status of second class courses. This attitude is clearly seen by students who know, full well, that a poor grade in these areas will do nothing to prevent promotion to the next grade. Regardless of the student's attitude toward the discipline music, no student refused to use the computers.

Computer usage clearly motivated the children during music class. This clearly reinforces the work of Kulik & Kulik, (1987); Feldstein, (1988); Ehle, (1986B); and Chopp, (1986). Discipline problems were less frequent as interest was maintained. The

writer is not sure, however, that any class that meets only one day a week will show improvement solely by the addition of CBI. Further work needs to be done in the area of retention on the effect of those classes that meet only one day a week as opposed to those that meet on a daily basis.

On the basis of the work done in this practicum, the writer's supervisor (the director of fine arts) has requested that technology be incorporated into the district's music curriculum. The writer will be responsible for the creation of this new chapter in the course guidelines. The positive results of the inservice, given by the writer, has led the director to order music software for all of the elementary schools. The district music teachers are looking forward to using computer-based instruction beginning in the academic year of Fall, 1991. The manner in which the teachers quickly adapted to the use of the computers reaffirms the work of Stevens (1980) and Manarino-Lettett & Cotton, (1985).

Computer software also needs to be evaluated for its use in group sessions, as opposed to solo use. The writer was disappointed with the amount of computer generated noise, in the form of musical tones, that occurred simultaneously, when an entire class was being taught in one lab. The musical pitches, so critical in performance of most software, themselves became the source of distraction. When the entire computer lab was in operation it became extremely difficult for students to focus in on the pitches emanating from their computer. This raised the

frustration level of many students, especially those with no prior music reading experience. Concentration became difficult and on several occasions, students noted that they would prefer not to use the computers.

Keeping a personal computer in the music room may be one alternative. Students would be able to, at the discretion of the teacher, work on their own, while the reminder of the class learned music through traditional means. The danger here is, of course, the pitches played by the computer, might very well distract the teacher and those not using the computer.

In whatever form computer assisted instruction is used, it must be tempered with standard teaching techniques, such as lectures, audio visual presentations, and discussions to give the broadest-based presentation (Abeles et al., 1986; Kessner, 1988; Placek, 1985; Willett & Netusil, 1986). It only when these ideas work in concert that retention can be improved.

Finally, the writer has become aware of the importance of understanding the level of development of any child being taught. This level of development must be considered when designing measurable objectives. Using the complete spectrum of Bloom's taxonomy makes these objectives more worthwhile and as well as more lively in a classroom situation.

The use of computers, and technology in general, makes the creation of objectives on all levels, very possible. It is no longer unusual to find a computer, or electronically generated

instruments in the music classroom.

Although the practicum was only three months long, the writer has seen tangible effects of the use of computer based instruction in the teaching of music. With the completion of this practicum, the writer's music education colleagues, as well as the supervisor of fine arts, and the assistant superintendent, have come to value the use of computers in the teaching of music.

The writer's school district has asked that this program be continued, not as an experimental problem, but as a requirement in the teaching of music, beginning in the school year of 1991-1992. The writer will responsible for including a new section into the existing curriculum, one entitled *Technology in the Music Classroom.*

Recommendations

1. It is recommended that any replication of this practicum be extended to four months.

2. It is recommended that this practicum be attempted at various grade levels from grade 2 through grade 8.

3. It is recommended that research be conducted on the effect of grades in the arts curriculum of elementary schools.

4. It is recommended that those music teachers involved in the practicum be surveyed within 6 months to measure their efficacy with CBI. A follow up workshop on appraising software should be

included. If necessary, a repetition of the practicum inservice workshop on the value and usage of computer based instruction be conducted.

5. It is recommended that, henceforth, the use of computers be inclusive in the secondary as well as the elementary music education curriculum of the practicum district. The secondary schools should become involved with a performance lab, such as a computerized piano lab or a musical instrument digital interface (MIDI) situation. The usage of computers with MIDI and keyboard would lead to composition via the computer as well as computer generated musical performances.

Dissemination

This practicum has been shared with all music education colleagues on the elementary and secondary level in the practicum school district.

The writer also plans to submit an abbreviated version of the practicum to the Music Educator National Conference (M.E.N.C.) journal, *Music Educators Journal.* An abbreviated version of the practicum will also be submitted to the *Journal of Research in Music Education.* The writer will also submit it to the M.E.N.C. for inclusion in the poster sessions of future national and eastern regional conventions.

Finally, the writer also will submit information on the practicum to the New Jersey Music Educators Association, for possible inclusion in its magazine, *Tempo*.

References

Abeles, H., Hoffer, C., & Klotman, R. (1986). Foundations of Music Education. New York: Schirmer Books.

Alberta Department of Education (1987). A strategic plan for microcomputers in school. Edmonton: Alberta. (ERIC Document Reproduction Service No. ED 291 353)

Argote-Freyre, F. (1989, March 11). Minorities concerned about development. Asbury Park Press. pp. C1, C12.

Berliner, D. (1987, February). Are you teaching students the right skills in retention? Instructor. p. 19.

Brand, M. (1984). Music Teacher Effectiveness Research. Houston, TX: College of Education, University of Houston. (ERIC Document Reproduction Service No. ED 253 443)

California State Department of Education. (1985). Computers in education: Goals and content. Sacramento CA: California State Department of Education. (ERIC Document Reproduction Service No. ED 255 192)

Casanova, U. (1987, February). Are you teaching the right skills in retention? Instructor. p. 19.

Chopp, J. (1986). The computer: integrating technology with education. Music Educators Journal, 73, (4), 22-5.

Colwell, R. (1970). The evaluation of music teaching and learning. Englewood Cliffs, NJ: Prentice Hall.

Cummings, C. (1980). Teaching makes a difference. Snohomish WA: Snohomish Publishers.

Davies, I. (1976). Competency based learning. New York: McGraw Hill.

DeLoughry, T. (1987, October 21). Computers are giving music education new sounds and new ways to teach. Chronicle of Higher Education, 34,(8), A14-A16.

Ehle, R. (1986a). Musicians and computers. The American Music Teacher, 35, (5), 30-45.

Ehle, R. (1986b). Some application of computers in music theory and composition. The American Music Teacher, 35, (5), pp. 21, 43.

Entwistle, N. (1981). Styles of learning and teaching. New York: John Wiley and Sons.

Feldstein, F. (1988). Technology for teaching. Music Educators Journal, 74, (7), 35-37.

Hickok, D. & Smith, I. (1974). Creative teaching of music in the elementary school. Boston, MA: Allyn and Bacon.

Hullfish, W. (1972). A comparison of two computer assisted instruction programs in music theory. Journal of Research in Music Education,20, (3), 354-361.

Hunter, M. (1986). R_x Improved Instruction. El Segundo CA: TIP Publications.

Kamii, C. (1973). Pedagogical principles derived from Piaget's theory: Relevant for educational practice. In Schwebel, M. &

Raph, J. (ed.) Piaget in the Classroom (pp. 199-215), New York: Basic Books.

Kassner, K. (1988). R_x for Technophobia. Music Educators Journal, 75 (3), 18-21.

Klotman, R (chair) et al. (1972). Teacher Education in music: Final Report. Washington, D.C.: Music Educators National Conference.

Kogan, N. (1976). Cognitive Styles in Infancy and Early Childhood. Hillsdale, N.J.: Lawrence Erlbaum.

Kulik, J. & Kulik, C. (1987, February). Computer based instruction: What 200 evaluations say. Paper presented at the convention of the Association for Educational Communications and Technology, Atlanta, GA. (ERIC Document Reproduction Service No. ED 285 521)

Lakewood Board of Education. (1989). Educational Facilities Master Plan for the Lakewood Public School District. Lakewood, N.J.: Unpublished.

Leonard, R. & LeCroy, B. (1986, November). A guide to software evaluation. Paper presented at the annual convention of the National Council of States on in-service education. Nashville, TN. (ERIC Document Reproduction Service No. ED 280 438)

Maddux, C. (1989). The harmful effects of excessive optimism in educational computing. Educational Technology,29 (7), 23-29.

Manarino-Lettett, P. & Cotton, B. (1985) Attitudes of teachers toward the use of computers in the schools. Fayetteville, NC: Fayetteville State University. (ERIC Document Reproduction

Service No. ED 280 455)

Montague, W., & Wulfeck, W. (1983). Computer based instruction: Will it improve instructional quality? San Diego: CA: Navy Personnel Research and Development Center. (ERIC Document Reproduction Service No. ED 256 296)

Newcomb, S. (1988). Computer based arts instruction: How are we doing? Design for Arts in Education, 89 (5), 46-49.

Phye, G. & Andre, T. (1986). Cognitive Classroom Learning. San Diego: Academic Press.

Placek, R. (1985). Choosing the best software for your class. Music Educators Journal, 72 (1), 49-53.

Rumery, K. (1986). Computer applications in music education. Technological Horizons in Education, 14, (2), 97-99.

Salisbury, D. (1985, January). Using microcomputers for drill and practice: Issues and implications. Paper presented at the meeting of the Association for Educational Communication and Technology, Anaheim, CA. (ERIC Document Reproduction Service No. ED 256 333)

Shehan, P. (1987). Effects of rote versus note presentations on rhythm learning and retention, Journal of Research in Music Education,35, (2), 117-126.

Sinclair, H. (1973). From preoperation to concrete thinking and parallel development of symbolism. In Schwebel, M. & Ralph, J. (ed.) Piaget in the Classroom (pp. 40-56), New York: Basic Books.

Taylor, J. (1987). Computers in music and music instruction. The joys of hardware and the woes of software. Design for Arts in Education (89)5, 50-55.

Tessmer, K. (1984). Children using computers: What are they doing? What are they really learning? Iowa City, IA: University of Iowa, School of library and information science. (ERIC Document Reproduction Service No. ED 252 192)

Thomas, R., Hunt, D., Gomez, M., & Schmidt V. (1986). Idea Bank: Computers in the Classroom. Music Educators Journal, 73 (4), 44-51.

Upitis, R. (1983). Milestones in computer music instruction. Music Educators Journal 69 (5), 40-42.

Upitis, R. (1987, April). A child's development of music notation through composition: A case study. Paper presented at the meeting of the American Educational Research Association. Washington, D.C. (ERIC Document Reproduction Service No. ED 284 780)

Wiggins, J. (1989). Composition as a teaching tool. Music Educators Journal, 75 (8), 35-39.

Willett, B. & Netusil, A. (1989). Music computer drill and learning styles at the fourth grade level. Journal of Research in Music Education.37, (9), 219-229.

Wohlwill, J. (1981, August). Music and Piaget: Spinning a slender thread. Paper presented at the annual meeting of the American Psychological Association, Los Angeles. (ERIC Document

Reproduction Service No. ED 208 984)

APPENDIX A

OUTLINE FOR UNIT ON MUSIC FUNDAMENTALS
SCHOOL YEAR 1989-1990

Unit outline for the teaching of music fundamentals

(All times are approximate, based on the level of each class and school calendar. Some classes completed the unit in eight weeks, while others need twelve.)

Classes 1/2: Students are introduced to idea of rhythm by correlating their previous knowledge of fractions with that of notes. Addition and fractional equality problems are taught. Students learn the names and shapes of whole, half, and quarter notes. Staff paper is passed out. Students practice drawing notes. Students change whole numbers into musical notes. (They are akinned to a "secret code".) Class assignment involves addition of notes such as:

Classes 3/4: After review of previous material, students are introduced to concept of measures, bar lines, and meter. Students are showed how to group notes into twos, threes and fours. Duple, triple and quadruple meter is introduced. Music is played for students to aurally identify the meter. Unison rhythmic performance is encouraged with Kodaly symbols. Class assignment involves creation of four different ways to write one measure of $\frac{4}{4}$ time using whole, half, and quarter notes.

Classes 5/6: After review of previous material, students review creation of measures and meter. The concept of time signatures is introduced. Students learn how $\frac{4}{4}$ is equal to 4/4

time. Students practice with other time signatures. Rhythmic performance of multi-meter is encouraged with Kodaly symbols. Class assignment is to compose five measures: one of 2/4, 3/4, 4/4, 5/4, and 6/4.

Class 7: The staff is reintroduced, now in terms of lines and spaces. The treble clef is taught and practice in drawing it is encouraged. Students are made to differentiate between lines and spaces. Mnemonic devices are used to name notes on the staff. Pitch direction and its relationship to sound is shown. No assignment is given.

Class 8/9 A classroom assignment follows a review of the note names of the treble clef staff. Students review pitch names by first creating five words using the letters A-G. Students are then asked to place the appropriate notes on the staff above the letters. The piano keyboard is introduced. Students draw the keyboard.

Class 10: Students are asked to place various note names on their keyboards. Using rhythm skills from classes 1-6, students try to finger a simple rhythm on their keyboard. No assignment is given.

Class 11: Students are asked to create an eight measure original melody, using skills taught in this unit. The composition will not be judged for aesthetic quality, but for correctness in notation. All notes are to be named. Students may play their compositions or the instructor will play them for the class.

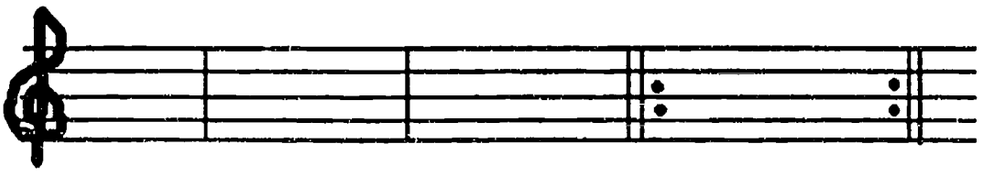
Students are reminded to be good listeners, and applaud after each "song".

Class 12: Teacher designed unit test is administered. A copy of this instrument can be found in Appendix B.

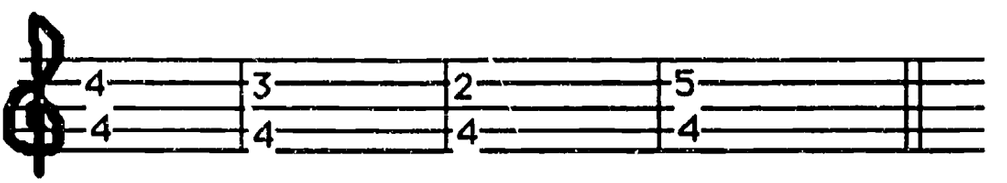
APPENDIX B

TEACHER DESIGNED INSTRUMENT GIVEN IN 1989-1990 FOR EVALUATION OF MUSIC FUNDAMENTALS

1. Look at the following symbols and identify them on the line.

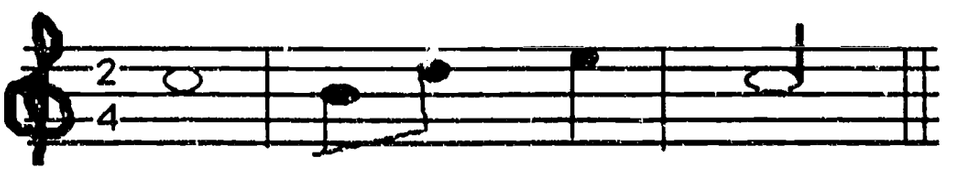


2. Look at the following measures of music. Beethoven fell asleep before he finished them. Find out what is missing in each measure and complete the measure.



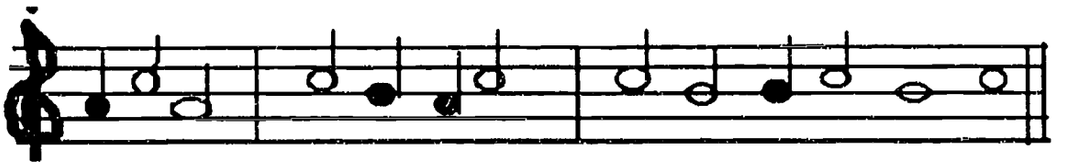
3. This time, Mozart forgot to put in the bar lines. Help him by counting the beats and placing the bar lines where they belong.

4. Now Bach needs help with the names of the notes (A-B-C-D-E-F-G). Put the correct letter under each note.



5. Now it's time to play "count the beats in each measure".

Let's assume each quarter note = one beat. What is the total number of beats in each measure?



_____ _____ _____

6. Now it's your turn to play Mozart! Compose (write) for me 8 measures of music in 3/4 time. Extra credit will be given if you name each note you write.

APPENDIX C

CLASSROOM ASSIGNMENTS FOR UNIT ON FUNDAMENTALS OF MUSIC

Assignments for fundamentals of music 1989-1990

Assignment 1 . Students will add the following musical notes to determine the total number of beats. Some examples can be seen in Appendix B, problem #5.

Assignment 2 . Students will create four different measures of music all equaling four beats, with the quarter note equalling one beat.

Assignment 3 . Students will create five measures of music using the time signatures 2/4, 3/4, 4/4, 5/4, and 6/4. Correctness will determined if the total number of beats equals the time signature.

Assignment 4: . Student are to find five words that only use the letters A-G and print them under one of the staffs. They will then draw the note with that letter name above that note. Whole notes are to be used. A mock piano keyboard is drawn.

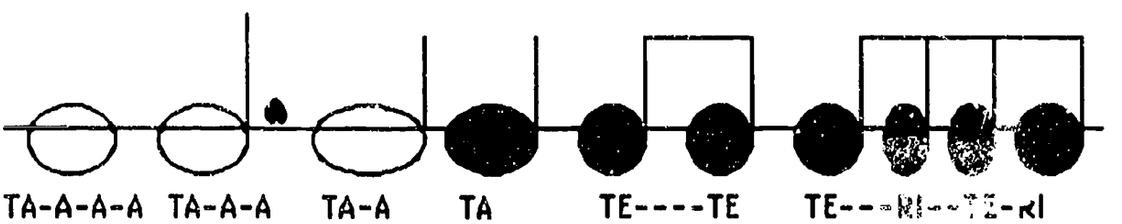
Assignment 5: . Students are to compose as original eight measure piece of music using correct notation, both of rhythm and note names. All notes are to be names, A-G.

APPENDIX D

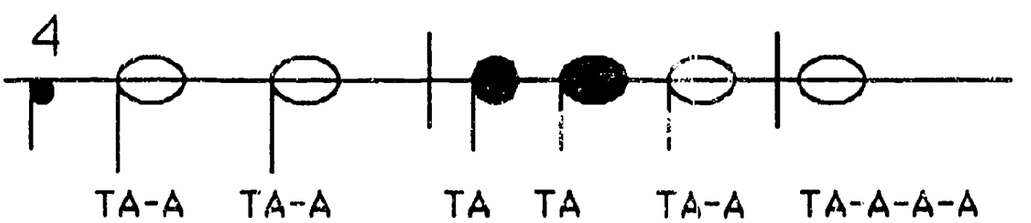
A DESCRIPTION OF RHYTHM SYMBOLS AS DEVISED BY ZOLTAN KODALY

Zoltan Kodaly, a Hungarian composer (1882-1967) is best known for his musical composition *Hary Janos Suite.* Yet among music educators his system of hand signals for teaching pitch to small children and his method of verbalizing rhythm patterns have become standards in the teaching of music. In fact, the word *Kodaly* itself is synonymous with the methodology.

Notes as verbalized using Kodaly.



An example of music as verbalized using the Kodaly method

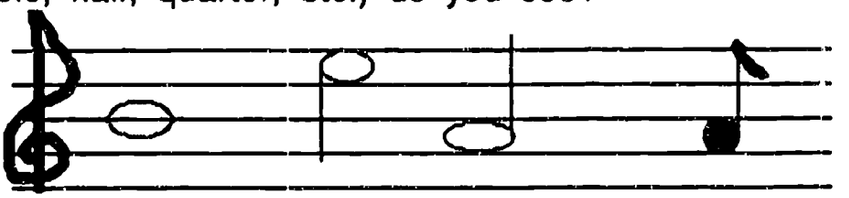


APPENDIX E

EXAMPLES OF PROBLEMS USED FOR STUDENT DEMONSTRATIONS

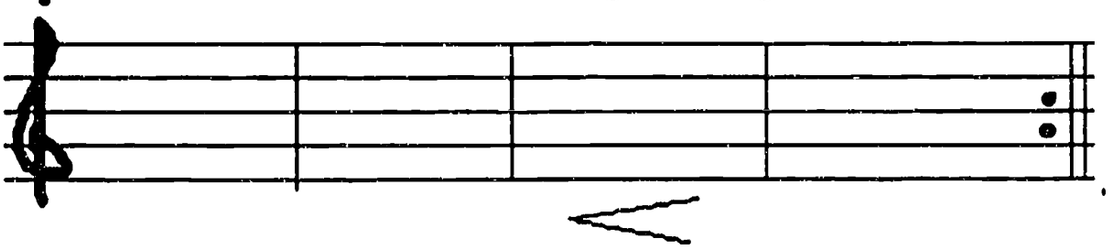
The following are selected examples of problems which would be used for student demonstrations. These would be transposed onto acetates for use on an overhead projector.

1. Look at the following group of notes. What type of note (whole, half, quarter, etc.) do you see?

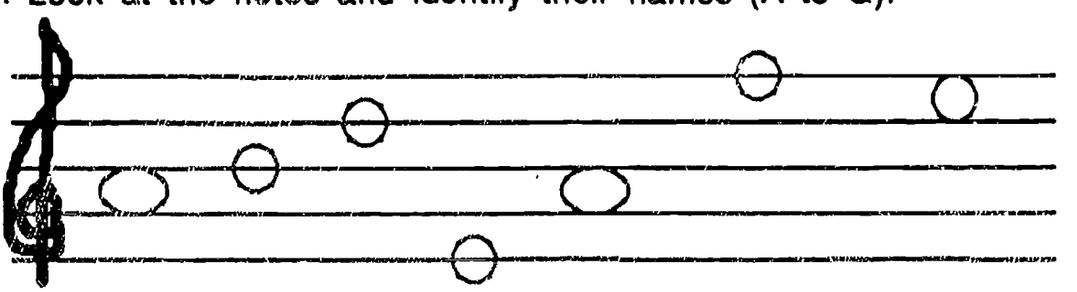


2. Count the amount of beats in each measure (quarter note=1 beat)

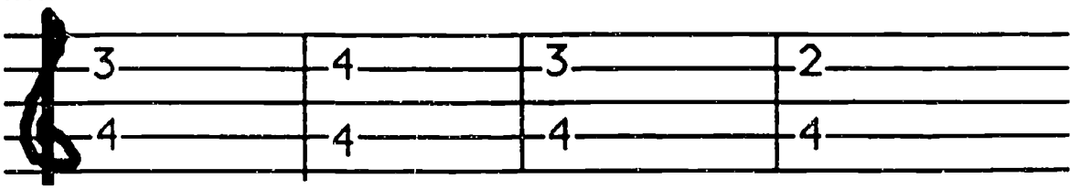
3. What is the name of the following road signs?



4. Look at the notes and identify their names (A to G).



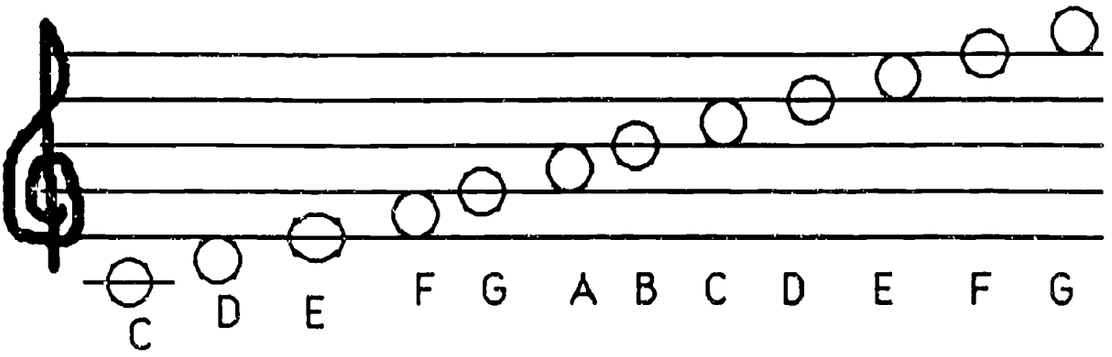
5. Create measures of music that match the time signature shown.



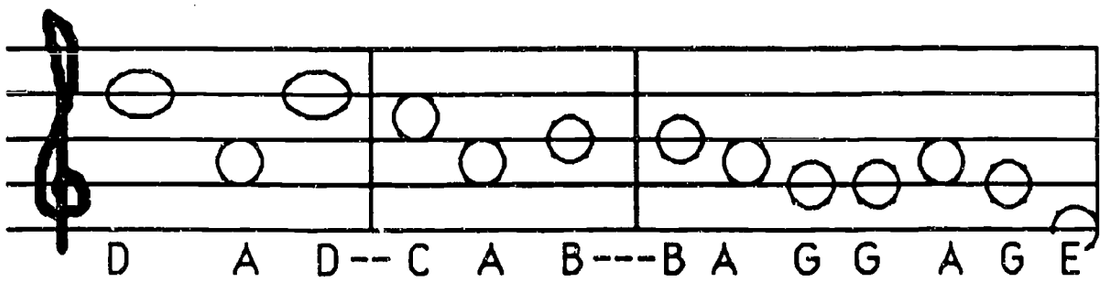
APPENDIX F

EXAMPLES OF WORDS NOTATED AS PITCHES ON THE TREBLE CLEF STAFF

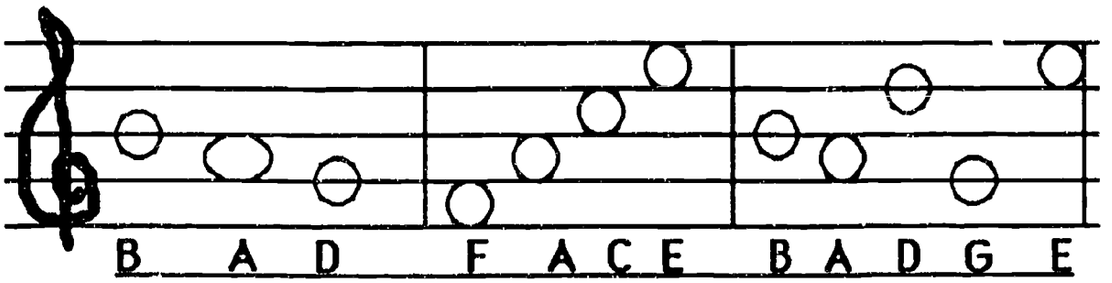
The scale from c^1 to g^2:



Words spelled out first, students are asked for notes (Encoding)



Notes listed first, words are required (Decoding)

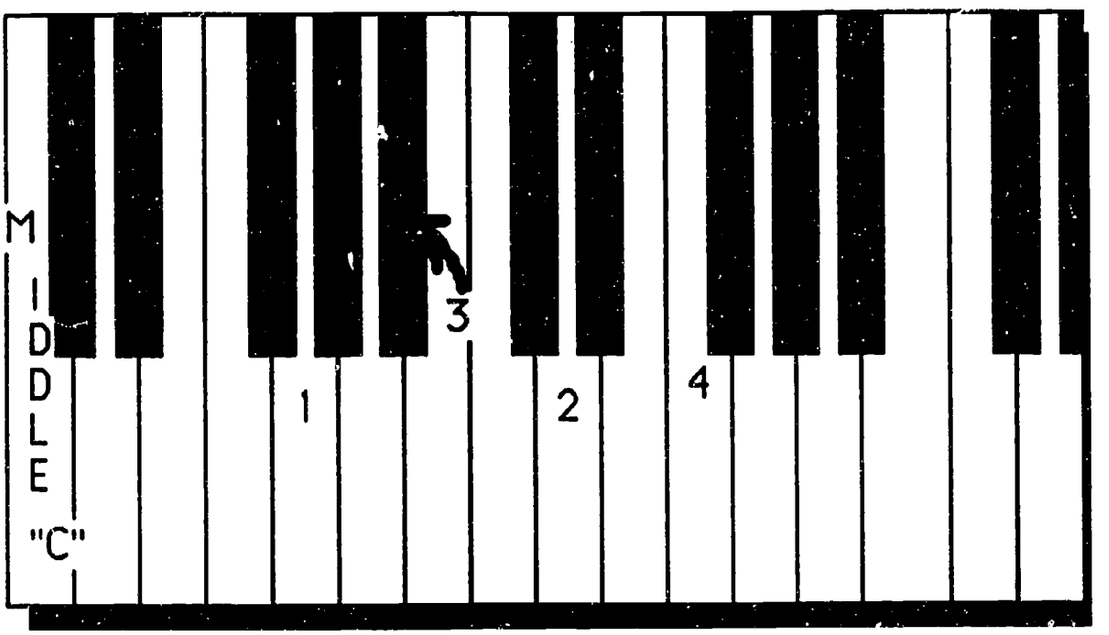


APPENDIX G

TEACHER DESIGNED INSTRUMENT TO EVALUATE UNIT ON FUNDAMENTALS OF MUSIC

The instrument used to measure the progress of students in the practicum was the same as that of Appendix B with the following additional keyboarding problems.

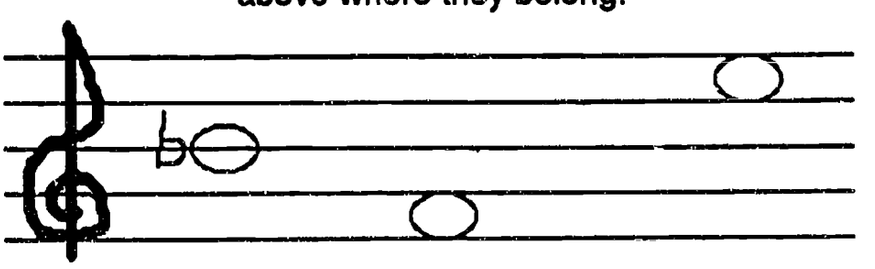
1. Look at the following picture of a piano. Note where Middle C is located. Now tell me the piano key that matches the numbers listed below.



What key is

#1_____#2_____#3_____#4_____?

Now look at the three notes written below. Pretend you were playing the piano, and place the numbers 5,6,and 7 on the picture above where they belong.



5 6 7